

REMARKS

This paper responds to the Office Action mailed on October 4, 2006.

Claims 27 and 44 are amended, no claims are canceled, and no claims are added; as a result, claims 27, 33, 36-38, 44-52 are now pending in this application.

§112 Rejection of the Claims

Claims 27, 33, 36-38 and 44-49 were rejected under 35 U.S.C. § 112, first paragraph, as lacking adequate description or enablement. Specifically, the examiner has indicated that limitations that describe the disclosed annealed metal silicide layer being unoxidized are not sufficiently supported in the written specification. Although Applicants do not agree with the Examiner's position, claims 27 and 44 are presently amended in order to further clarify the claimed subject matter. Withdrawal of the rejections under 35 U.S.C. § 112, first paragraph, is therefore respectfully requested.

Claim Objections

Claim 27 was objected to for informalities. Specifically, the Examiner has requested correction of a limitation in claim 27. Applicants have amended claim 27 in accordance with the Examiners instructions. Withdrawal of the objection is respectfully requested.

§103 Rejection of the Claims

Claims 27, 33, 36-38 and 44-52 were rejected under 35 U.S.C. § 103(a) as being unpatentable over U.S. Patent No. 6,541,164 to Kumar *et al.* (hereinafter, "the Kumar reference") in view of Applicant's admitted prior art (hereinafter, "the APA"), or alternatively, as being unpatentable over the Kumar reference in view of the APA and U.S. Patent No. 4,905,073 to Chen *et al.* (hereinafter, "the Chen reference"). Applicants disagree with the stated grounds of rejection and desire to further clarify various distinctions of the present invention over the cited art. Reconsideration of the present application is therefore requested in light of the present amendment and following remarks.

Although the disclosed embodiments of the invention may be discussed in comparison to the prior art, it is understood that any discussion of the disclosed embodiments, as well as any

discussion of the differences between the disclosed embodiments of the present invention and the prior art do not define the scope or interpretation of any of the claims. Instead, such discussed differences, if presented, are offered merely to help the Examiner appreciate important claim distinctions as they are discussed.

The Examiner has applied the Kumar reference for disclosing a gate stack that includes, *inter alia*, "...an antireflection layer 18 comprising $\text{Si}_x\text{N}_y\text{O}_z\text{:H}\dots$ ", and asserts that this teaching is found at column 9, lines 1-7 of the Kumar reference. Applicants respectfully disagree, and further submit that the Examiner failed to understand what the Kumar reference fairly discloses. Referring to column 9, Kumar clearly states that: "...the ARC [anti-reflection coating] 18 preferably includes *silicon, nitrogen and oxygen*...". (Emphasis added). Further, at column 9, lines 4-6, the Kumar reference teaches a preferred "...composition of matter having the formula: $\text{SiO}_x\text{N}_y\text{H}_x\dots$ ".

In contrast, in the various disclosed embodiments of the present invention, the layer 50 comprises silicon, nitrogen, oxygen and hydrogen (col. 4, lines 33-36) that may be combined according to the formula : $\text{Si}_x\text{N}_y\text{O}_z\text{:H}$, where the hydrogen content may be adjusted to impart a desired absorbance characteristic to the deposited layer. Accordingly, Applicants submit that the Kumar reference fairly teaches a antireflective layer having a different chemical composition. Although the Applicant's APA discloses a similar chemical formulation, and states similar ranges, Applicants nevertheless maintain that Applicant's APA discloses a different structure. For example, the Applicant's APA structure includes a metal silicide layer that is spaced apart from the antireflective layer by a nitride layer and an oxide layer.

The Examiner also cites the Chen reference for teaching annealing a metal silicide layer in a nitrogen atmosphere, and for allegedly teaching the equivalence of a tungsten silicide layer and a titanium silicide layer. Applicants disagree with the Examiner's interpretation of the Chen reference. Chen does not teach or fairly suggest any such equivalence. Instead, Chen discloses at column 3, lines 27-30 that: "The metal is typically refractory, and in the preferred embodiment is titanium, with others being *possible*, including...tungsten...". (Emphasis added). Applicants respectfully assert that a mere possibility does not rise to the level of equivalence. In any case, Applicants submit that the Chen reference fails to provide the disclosure missing from the Kuman reference and the Applicant's APA.

Turning now to the claims, differences between the claim language and the cited art will be specifically pointed out. Claim 27, as amended, recites in pertinent part: “A gate stack, comprising...*a layer comprising $Si_xN_yO_z:H$ formed over and in physical contact with the metal silicide layer...*”. (Emphasis added). The Kumar reference does not disclose the foregoing formulation, as described more fully above. Although the Applicant’s APA discloses this, the Applicant’s APA fails to disclose a $Si_xN_yO_z:H$ layer in physical contact with the metal silicide layer. Accordingly, claim 27 is allowable over the cited combination. Claims depending from claim 27 are also allowable based upon the allowable form of the base claim and further in view of the additional limitations recited in the dependent claims.

Claim 44, as amended, recites: “A gate stack, comprising...*a means for protecting the metal silicide layer during an anneal, the means for protecting consisting of a $Si_xN_yO_z:H$ layer formed over and in physical contact with the annealed, metal silicide layer...*”. (Emphasis added). Again, the Kumar reference simply does not disclose the claimed formulation. The Applicant’s APA fails to disclose or suggest the structure recited in the claim. Claim 44 is therefore also allowable. Claims depending from claim 44 are also allowable based upon the allowable form of the base claim and further in view of the additional limitations recited in the dependent claims.

Finally, claim 50 recites: “A gate stack, comprising...*a means for alleviating stress on underlying layers, canceling reflected radiation, and protecting the annealed, titanium silicide layer during an anneal from gaseous oxygen, the means comprising a $Si_xN_yO_z:H$ layer formed over and in physical contact with the annealed, titanium silicide layer...*”. (Emphasis added). As discussed in greater detail above, the Kumar reference does not disclose the claimed formulation. The Applicant’s APA fails to disclose or suggest the structure recited in the claim. Claim 50 is therefore allowable over the cited art. Claims depending from claim 50 are also allowable based upon the allowable form of the base claim and further in view of the additional limitations recited in the dependent claims.

CONCLUSION

Applicant respectfully submits that the claims are in condition for allowance, and notification to that effect is earnestly requested. The Examiner is invited to telephone the undersigned at 612-349-9587 or Applicant's attorney Steven H. Arterberry at (206) 230-8156 to facilitate prosecution of this application.

If necessary, please charge any additional fees or credit overpayment to Deposit Account No. 19-0743.

Respectfully submitted,

ZHIPING YIN ET AL.

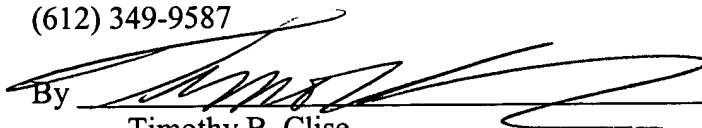
By their Representatives,

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Date

4 Jan '07

By



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CERTIFICATE UNDER 37 CFR 1.8: The undersigned hereby certifies that this correspondence is being deposited with the United States Postal Service with sufficient postage as first class mail, in an envelope addressed to: Mail Stop Amendment, Commissioner of Patents, P.O. Box 1450, Alexandria, VA 22313-1450 on this 4 day of January 2007.

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